

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Ashton, et al

Confirmation No.:

Application No.:

Examiner:

Filing Date: Sept. 26, 2003

Group Art Unit:

Title: ULTRA-HIGH DENSITY STORAGE DEVICE USING PHASE CHANGE DIODE MEMORY CELLS AND METHODS OF FABRICATION THEREOF

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or  
(Within three months of filing national application; or date of entry of national application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:  
☐ Statement under 37 CFR 1.97(e), or  
☐ a \$180.00 fee under 37 CFR 1.17(p), or  
(After the CFR 1.97 (b) time period, but before final action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97 (d) together with a:  
☐ Statement under 37 CFR 1.97(e)(1) or (2), and  
☐ a \$180.00 fee set forth in 37 CFR 1.17(p).  
(Filed after final action, a notice of allowance, on or before payment of the issue fee)

Please charge to Deposit Account **08-2025** the sum of \$0.00. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **08-2025** pursuant to 37 CFR 1.25.

☒ Applicant(s) submit herewith Form PTO 1449 - Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individuals(s) designated in 37 CFR 1.56 (c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on form PTO 1449 and is enclosed herewith.

It is requested that the information disclosed herein be made of record in this application.

"Express Mail" label no. **EL 980208871 US**

Date of Deposit **Sept. 26, 2003**

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Washington, D.C. 20231.

By Vaughn W. North  
Typed Name: **Vaughn W. North**

Respectfully submitted,

**Ashton, et al**

By

Vaughn W. North  
**Vaughn W. North**

Attorney/Agent for Applicant(s)

Reg. No. **27,930**

Date: **Sept. 26, 2003**

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR  
APPLICANT'S INFORMATION DISCLOSURE  
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200206465-1

APPLICATION NO.

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GROUP

## REFERENCE DESIGNATION

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	1A	5,557,596	09/17/96	Gibson et al	
	1B	6,256,224	07/03/01	Perner, et al.	
	1C	6,262,421	07/17/01	Tran	
	1D				
	1E				
	1F				
	1G				
	1H				
	1I				
	1J				
	1K				

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	1L					
	1M					
	1N					
	1O					
	1P					

## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	1Q	Kampmann, et al. A Cadmium-free CuInSe <sub>2</sub> Superstrate Solar Cell Fabricated by Electrodeposition Using a ITO/In <sub>2</sub> Se <sub>3</sub> /CuInSe <sub>2</sub> /Au Structure; Progress in Photovoltaics; (1999) pgs. 129-135.
	1R	Rechid, et al. Characterising Superstrate CIS solar cells with electron beam induced current; Thin Solid Films; (2000) pgs. 361-362.
	1S	Ward, et al. Cu(In,Ga)Se <sub>2</sub> Thin-Film Concentrator Solar Cells; NCPV Program Review Meeting; 10/01.

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	2L					
	2M					
	2N					
	2O					
	2P					

## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

2Q	Scofield, et al. Sputtered molybdenum bilayer back contact for copper indium diselenide-based polycrystalline thin-film solar cells; Thin Solid Films (1995) pgs. 26-31
2R	Gabor, et al. High-efficiency $\text{CuIn}_x\text{Ga}_{1-x}\text{Se}_2$ solar cells made from $(\text{In}_x\text{Ga}_{1-x})_2\text{Se}_3$ precursor films; American Institute of Physics, (1994) pgs. 198-200
2S	Nakayama, et al. AES, LEELS and XPS studies on the interface formation between layered semiconductors GaSe and InSe; Surface Science (1991)

EXAMINER

DATE CONSIDERED

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3Q	Nishida, et al. Single-beam overwrite experiment using In-Se based phase-change optical media; American Institute of Physics (1987) pgs. 667-669
3R	Sanchez-Royo, et al. Optical and photovoltaic properties of indium selenide thin films prepared by van der Waals epitaxy; Journal of Applied Physics (2001) pgs. 2818-2823
3S	Otsmane, et al. Epitaxy of layered semiconductor thin films; Applied Surface Science (1993) pgs. 479-481

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DATE CONSIDERED

**PATENT APPLICATION**

Sheet 4 of 5

<b>FORM PTO-1449</b>  <b>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</b>  (Use several sheets if necessary)	ATTY. DOCKET NO.	APPLICATION NO.	CONFIRMATION NO.
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**REFERENCE DESIGNATION****U.S. PATENT DOCUMENTS**

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	4L					
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	4N					
	4O					
	4P					

**OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)**

4Q	Emery, et al. Reflection high-energy electron diffraction studies of InSe and GaSe layered compounds grown by molecular beam epitaxy; Journal of Applied Physics (1992) pgs. 3256-3259
4R	Tatsuyama, et al. Heteroepitaxy between layered semiconductors GaSe and InSe; Applied Surface Science (1989) pgs. 539-543
4S	Gashimzade, et al. Energy spectrum and effective mass of carriers in the InSe/GaSe superlattice; Z. Physics (1996) pgs. 219-222

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Sheet 5 of 5

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	5Q	Shigetomi, et al. Electrical and photovoltaic properties of Cu-doped p-GaSe/n-InSe heterojunction; Journal of Applied Physics; (2000); pgs. 1520-1524
	5R	
	5S	

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